What is Organic

In 2007 the organic dairy sector accounted for $1.3 billion and nearly 2.7 % of the nations milk sales (8). This adds up to 5.02 billion pounds of fluid milk, which is an increase of nearly 2 % from 2006. The organic industry is growing at an extremely fast pace, before the current economic downturn there was nothing showing a decrease in the organic sectors growth. The cost of organic milk at local supermarkets is a considerable amount more than the conventionally produced milk. These high prices at supermarkets are passed on to the producer. Many smaller farming operations are considering the transition to organic operations. The number of organic cows in 2000 was roughly 38,000 in 2005 the number had increased to nearly 85,000, an average increase of nearly 25 percent per year (6).

The positive organic growth has influenced small family farms to switch from conventional operations to organic farming. After the transition to organic, the operations will likely see significant increases in profitability. The ability for our small farms to thrive is very beneficial for the dairy industry as well as the economy. Between the years 2002 and 2005 the organic dairy industry grew by 30 % (10). The costs to produce organic milk caught up with dairymen around 2006. The costs averaged $5 - 7 higher then conventional dairies (6). The encouraging aspect was that organic dairies received an average milk premium of $6.69 higher then conventional (6). There are many requirements involved in an organic operation,

recognizing efficient practices and proper maintenance essentials will better ones future as a dairyman whether organic or conventional.

Table 1. Organic dairy operations established across the US (11).

State	Certified organic dairy cows	Total dairy cows	Certified organic/ total (%)	Certified organic dairy farms	Total dairy farms	Certified organic/ total (%)
Wisconsin	10,803	1,344,000	0.8	223	19,100	1.2
California	9,251	1,523,000	0.6	9	2,500	0.4
New York	6,704	686,000	1.0	65	7,200	0.9
Pennsylvania	5,450	617,000	0.9	82	10,300	0.8
Vermont	3,025	159,000	1.9	55	1,600	3.4
Oregon	2,424	90,000	2.7	18	820	2.2
Minnesota	2,238	534,000	0.4	...	7,800	...
Maine	1,950	40,000	4.9	40	600	6.7
Total	41,851	4,993,000	0.8	492	42,120	1.2

The dictionary definition of organic is to relate, yield, or involve the use of food produced without the use of feed or fertilizer of a plant or animals origin without employment of chemically formulated fertilizers, growth stimulants, or pesticides. It refers to the way agriculture products are grown and processed. Organic supporters claim it is a way to enhance the soils fertility without the use of synthetic petroleum based products that result in an overabundance of nitrogen and phosphorus in the soil (8).

Today's organic industry has come along way. In 2008 the increased organic consumption was estimated at $26.9 billion dollars in national sales (See Figure 1.). An organization that desires to be declared organic must initially sell over $5000 per year in organic products. If chosen to sell their products to be used as organic ingredients or in organic feed a USDA accrediting agency must certify them.

> The Organic Foods Production Act (OFPA), enacted under Title 21 of the 1990 Farm Bill, served to establish uniform national standards for the production and handling of foods labeled as "organic." The Act authorized a new USDA National Organic Program (NOP) to set national standards for the production, handling, and processing of organically grown agricultural products. In addition, the Program oversees mandatory certification of organic production. The Act also established the National Organic Standards Board (NOSB) which advises the Secretary of Agriculture in setting the standards upon which the NOP is based. Producers who meet standards set by the NOP may label their products as "USDA Certified Organic." (12)

The Act has helped the organic industry become more restricted, the rules and regulations give the organic industry power to market itself. The rules and regulations set state that dairy animals must be fed and managed, which consists of dairy husbandry, organically for at least one year prior to the production of organic milk. Feed must be 100% organic for three years prior to the date of certification. Organic dairy cattle must have access to the outdoors and during dry months must have access to pasture. Organic dairy producers must establish preventative health management practices, medical treatment cannot be withheld from sick cows to maintain the animals' organic status (10). The use of growth hormones, antibiotics, genetic engineering, and cloning is prohibited. The feeding of slaughter by-products

is also forbidden. All organic dairy production and processing operations must be certified by USDA-accredited certification agencies (third party agencies). Detailed records of all feeds and medications must be maintained. The integrity of organics should be protected by preventing the organic dairy cattle from coming in contact with prohibited substances or being commingled with non-organic products. The organic dairy sector performs annual inspections of all certified operations and is subject to spontaneous audits. Handlers of organics are required to keep shipments separate from all other conventional goods, the organic commodities are to be stored in containers that do not compromise the organic nature of the product. During shipments organics cannot be packaged in containers that contain any fungicides, pesticides, preservatives, or fumigants. It was not till October 2002 when the USDA applied the national organic standards, these regulations made producers, processors, and distributors be certified by the state. The national organic standards are those that address the methods, substances, and practices allowed in the production of organic milk.

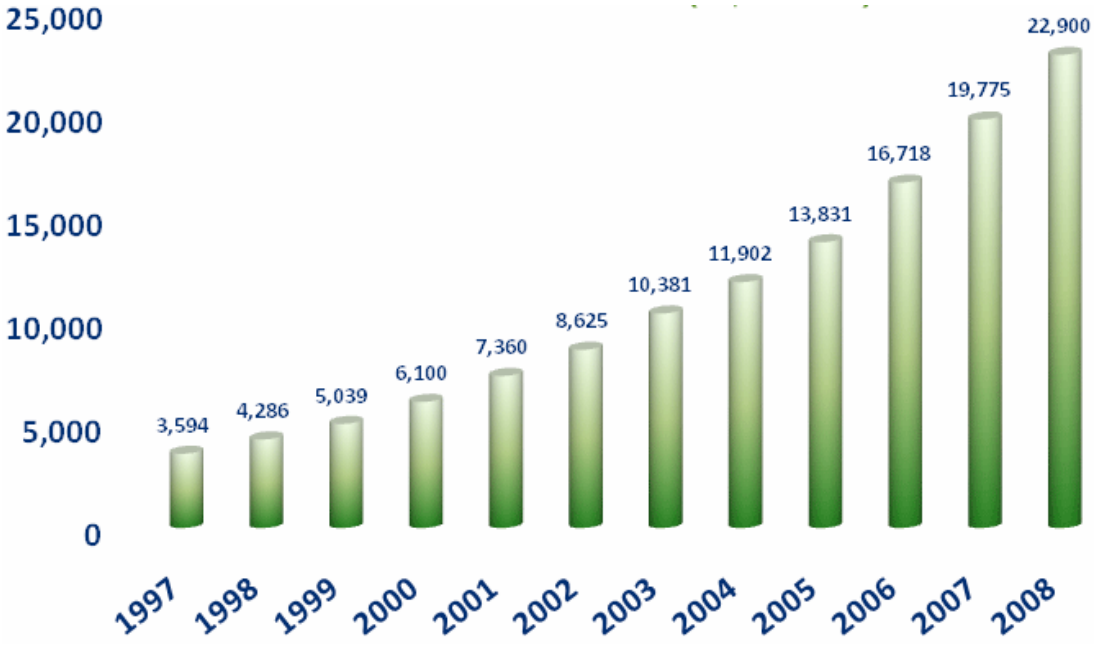

Figure 1. Increasing Organic consumption per year in billion dollars (11)

The organic dairy sector has been the fastest growing product of all organic commodities. In 2003 organic dairy products accounted for roughly $900 million and 9 percent of all commodities in the organic market (8). The high demand put on retailers by consumers has been very beneficial to the organic industry. The increase in consumption of organic products is creating a more feasible dairy industry for farmers and ranchers.

The increase in organic sales has begun a whole new trend of supermarkets. More all natural and organic stores, such as Whole Foods and Trader Joes are opening. These new stores are acquiring many of the Vons, and Albertsons customers. The

competition requires larger chain retailers to provide these quality organic products for the consumer in order to keep them loyal (1). This is why there has been such a large increase in the consumption of organic products, the ability to provide the "organic" title while keeping the costs manageable is increasing sales at box store.

Go Organic

The organic process eliminates many of the pesticides, herbicides, fungicides, chemically enhanced fertilizers, and other growth stimulants that are petroleum based. By doing so, the soil and the environment we live in are enhanced. Many people argue the antibiotics, hormones, and vaccines that are introduced into a dairy cow's system are unhealthy for consumers of the end product. Organic supporters claim that dairy cows that are pasture fed produce 500 percent more conjugated linoleic acid (CLA). It is also claimed that organic milk contains 71 percent more omega 3, 50 percent more vitamin E, and 75 percent more beta carotene. Organic milk is also claimed to have two to three time's higher concentration of antioxidants lutein and zeaxanthin than non-organic milk (9). These figures may be biased due to the fact that these cattle were grazing in lush red clover pastures.

Many organic supporters choose to purchase organic products because of the controversial topic about Bovine Growth Hormone (BGH). Many uneducated supporters of organic believe the hormone will give them cancer. The hormone BST causes an increase in insulin-like growth factor (IGF-1) that has been linked with cancer. The argument is that BGH is a protein hormone, which indicates that if any BGH does make its way through the cow's body into its mammary system and eventually into the milk, it will be destroyed by the enzymes and acids of the digestive tract. No scientific study shows that organic foods are safer, healthier or

more nutritious than conventional foods. The "organic" label only means that the products were raised inefficiently without benefit of several modern technologies. Milk whether organic, conventional with rBST or conventionally produced without the use of rBST is much the same chemical makeup. Marketing and labels that imply otherwise hardly educate the public. Mostly, they line the pockets of the companies selling them at a premium (see Table 2).

Table 2. Organic and conventional milk prices by region (1).

Region	Milk price per half gallon		Organic premium	
	Organic	Conventional		
	Dollars		*Dollars*	*Percent*
East	4.52	2.01	2.52	126
Central	3.81	1.85	1.96	106
South	2.80	2.01	1.79	89
West	3.90	2.27	1.63	72
National average	4.01	2.02	1.99	98

Organic products are extremely beneficial to the environment. The application of chemicals, pesticides, fungicides, and fertilizers that are mainly petroleum based products puts a giant toll on the quality on soil, air and water. Maintaining agriculture land without synthetic applications is very strenuous on management. Labor that is required of organic operations is extensive. The use of cover crops, animal manure and crop rotations are all used to maximize crop yields and improve long-term soil health. Crop yields are drastically reduced when organic practices are

implemented. The competition for water between weeds and plants create large amounts of stress and reduce size and substance of the plant.

Organic dairies are required to provide pasture space for cows. Pasture management becomes an important tool with all operations that allow grazing. Over grazing a field is very costly due to the fact that it will take a field a significant amount more time to grow the pasture back to suitable length. The amount it costs to feed the livestock alternatives such as organic silage, alfalfa, and grain are extremely expensive and put financial strain on the dairymen. On the other side, under grazing a pasture is not as damaging. Rotating pastures frequently is advised and encouraged if possible. The only added cost to more frequent rotations is increased labor. Finding the proper ratio of pasture time and labor will result in the lush pastures with minimum labor costs.

Transitioning to an organic dairy requires a considerable amount of time and resources. It takes three years for pastures, fields, and all land used to grow feedstuffs to be certified organic. During these three years, the land is expected to be farmed as an organic operation and all conventional farming practices need to be dismissed. For livestock one year of organic practices is required for certification (7). This puts financial strain on farmers as they must produce organic grade products for one to three years before seeing the extra organic premiums. Producers must be prepared for both management and financial challenges.

On the positive side there are countless rewards for successful transitioning. Producers who plan financially, embrace alternative plans, and learn from the experiences of others will enjoy an accomplished transition. Success is unlikely if the transition is undertaken as a last resort to alleviate production or financial problems.

Environmental Effects

There are many positive effects organic farming has on the environment. Soil and water are the main beneficiaries of organic farming. By no means does this statement imply that conventional farming is harmful to the environment. Weather is the largest factor affecting the pollution of land and water. Large rains create erosion in soils. Erosion in soil is very damaging to crops, and jeopardizes the integrity of the land and its landscape. Water searches for the easiest way down, and with heavy rains, it is not unlikely that water flow will create ruts all over a field. Run off is a large factor to polluted waterways.

It is inevitable that organic and conventional dairies create manure. Manure management has been a large concern for farms all over the U.S. Many organic farms dispose of manure as fertilizer. When done at the right time, this practice is very beneficial for crops. Manure as a topical fertilizer introduces large amounts of amino acids and nitrogen into the soil. Bacteria in the ground undergo two separate cycles to break these added nutrients down, (denitrification and nitrification) and the final product is consumable by the plant. Application on manure as a fertilizer is very risky during certain times of the year due to unclear weather patterns. Spontaneous rains cause manure to run off, potentially contaminating nearby creeks and rivers. Many conventional dairies are finding efficient alternatives for manure. Manure is being used as bedding. It is composted and dried in an attempt to kill the bacteria and pathogens so it is no longer harmful. Using this form of bedding has an

increased risk of mastitis (7). Organic operations cannot risk the increased likelihood of mastitis, nor can they afford the costs of treatment (see Table 3.).

Table 3. Management practice on organic and conventional farms (6).

	Conventional		Organic		
Item	Number of herds or cows	(%)	Number of herds or cows	(%)	*P*-value
Identification of clinical mastitis					
Observe milk	18	(90.0)	9	(45.0)	0.002
Other methods (below)	2	(10.0)	11	(55.0)	
Abnormal milk on filter	1	(5)	2	(10)	
CMT positive	0	(0)	2	(10)	
Swollen quarter	1	(5)	6	(30)	
Other method	0	(0)	1	(5)	
Determination of cure after treatment of clinical mastitis					
Observe normal milk	15	(75.0)	4	(20.0)	<0.001
Other methods (below)	5	(25.0)	16	(80.0)	
CMT negative	2	(10.0)	5	(25)	
Udder looks and feels normal	0	(0)	6	(30)	
Test day SCC	2	(10.0)	3	(15)	
Treatment is completed	1	(5)	0	(0)	
Other	0	(0)	2	(10)	
Number of cows culled for mastitis	345 of 3,937[2]	8.8	129 of 1,449[3]	8.9	0.75
Proportion of specific culling reasons for cows culled for mastitis					<0.001
Repeat clinical case	209	51.7	81	9.8	
High SCC	64	26.8	23	43.3	
Blind quarter	2	2.6	25	3.9	
Chronically infected	53	7.0	0	0.0	
Other	17	11.8	0	0.0	
Culture of some clinical cases of mastitis					
Yes	16	(80.0)	4	(20.0)	<0.001
No	4	(20.0)	16	(80.0)	
Dry-off method					
Abrupt	19	(95.0)	8	(40.0)	<0.001
Intermittent	1	(5.0)	12	(60.0)	

Nutrients of soils farmed conventionally are said to be depleting. The soils are not given the necessary time to regenerate which is essential to proper rehabilitation of the ground. Good crops are made with synthetic chemicals. The disadvantage of this approach is that it does nothing to improve the soil or the long-term productivity

of our fields and pastures. As beneficial as synthetic fertilizers and chemicals are, they can have negative effects, the longer they are used, the more dependent the soils become upon them. The soil microbes have no organic matter for food and therefore they disappear.

Cost of Production

The success of any operation depends on input and output. A dairies output is always fluctuating, though not usually in an abrupt manner. The total cost of production on a per cow and per hundred-weight basis was roughly 10% higher for organic producers when compared within the region and 20% higher when compare on a statewide basis (5) (see Table 2.). The higher costs appears to be due to reduced milk production, higher feed costs, higher average labor costs, significantly higher herd replacement costs and high transition costs. The milk prices change frequently and trends are easy to see.

The input in both organic and conventional dairies is astounding. Feed prices soar and the cost to transport the feedstuffs is also very high. Before the current economic struggles feed, was becoming scarce and extremely difficult to obtain at a price at which a dairyman could make money. With the current dairy situation, it is estimated that nearly one sixth of California's 1.8 million dairy cows will possibly be culled. This will greatly affect feed availability throughout the state. Many of the grains fed to livestock on the west coast are shipped in from Midwestern states. As a result costs remain high due to the transportation. These costs are much higher for those on the west coast compared to the Midwestern states. California has grown accustomed to the high price of feed and, in an attempt to lower feed costs, many operations have vertically integrated by growing as much of their own feed as possible.

Table 4. Price per ton for organic feedstuffs in 2006 (7)

Commodity	Price per ton
Soy Bean Meal	$600-$700
Corn	$220-$280
Flax meal	$380-$450
Wheat	$180-$200
Wheat runs	$170-$190
Cotton Seed	$450-$470
Alfalfa Hay	$170-$230
Grass Hay	$120-$170
Mineral (lactating cow)	$650-$800
Corn silage	$45-$50
Field peas	$280-$350

Cost of organic commodities can range between 50% and 300% more than conventional (7) (see Table 4.). Fluctuating costs depend on the commodity and the cost of transportation. This results in a much higher average feed cost per cow and per hundred weights. To reduce the cost of producing organic milk, organic producers rely mostly on substituting pasture for high-priced roughages and feed concentrates. This is one of the factors that plays a key role in the reduced milk yields. Organic cows do not get the nutrients in concentrated amounts that conventional animals receive.

Labor costs for organic dairies require much more intensive management. The practices involved are applied in order to reduce any risk of disease, stress and trauma. Management of grazing requires more personnel to ensure that cows out on

pasture are not becoming sick or injured. Pastures also require more work in order to stay green. There are irrigation issues that are needed of pastures and, with more pipes, there comes more labor. Fences need to be moved more frequently in order for proper grazing rotations.

Maintaining herd health is the number one priority for organic dairy producers. Because the cows are not allowed any antibiotics, training laborers to notice abnormalities at an early stage is very important. The time it takes to train employees to notice and treatment illnesses costs the employer heavily. Once an employee develops a cow sense they become very valuable. Employees on both conventional and organic dairies are critical, but it is paramount on organic dairies that employees are attentive to detail.

Several reports show that organic milk production is between 15% and 25% lower when compared with conventional herds that do not use rBST (8). Factors that contribute to the lower production are poor nutrition, lack of feed additives, longer time to recover from diseases, and lower genetic potential. The literature does not show any data on the number of dysfunctional quarters in organic herds when compared to conventional herds. Antibiotics are prohibited in organic dairies, therefore one would believe that the percent of lost quarters is higher in organic dairies due to an increased incidence of mastitis. A portion of the reduced milk production of organics may be due to an increased incidence of lost quarters. The reduced milk production is offset by the higher milk premiums.

There are many costs that occur in a dairy operation (see Table 5.). Every aspect of farming costs can make or break farming operations. Organic dairies have a very difficult time during the transition period due to extremely high costs with no added pay premiums. The extra attention required for organic herds is the main reason added costs occur. Every aspect of the organic operation including milking, pastures, feed, bedding, facilities, and practices all require additional labor.

Table 5. Organic and Conventional budget comparison (8)

Item		Unit	Organic Price	Quantity	Organic 16,000/Cow	Conventional 16,000/Cow	Organic 15,000/Cow
Cash Income							
Milk		CWT	$24.50	$16,000.00	$392,000.00	$248,000.00	$367,500.00
Cull Cows	26 @ 13	CWT	$45.00	$338.00	$15,210.00	$15,210.00	$15,210.00
Bull Calves		HEAD	$100.00	$47.50	$4,750.00	$4,750.00	$4,750.00
Patronage Dividends					$19,600.00	$12,400.00	$18,375.00
		TOTAL CASH INCOME			$431,560.00	$280,360.00	$405,835.00
Cash Expenses							
Grass Hay	5.0%	TON	$140.00	$200.00	$28,000.00	$14,000.00	$28,000.00
By-Pass Protein	2.0%	TON	$224.00	$176.10	$39,446.40	$19,723.41	$39,446.40
Soybean Meal	2.0%	TON	$500.00	$100.00	$50,000.00	$25,000.00	$50,000.00
Corn Grain	2.0%	BU	$5.00	$12,000.00	$60,000.00	$30,000.00	$60,000.00
NPN	2.0%	TON	$500.00	$1.47	$733.13	$366.56	$733.13
Intensive Pasture	2.0%	TON	$40.00	$1,200.00	$48,000.00	$24,000.00	$48,000.00
Pasture – Dry Cows/Heifers		ACRE	$40.00	$125.00	$5,000.00	$2,500.00	$5,000.00
Minerals		HEAD	$120.00	$100.00	$12,000.00	$6,000.00	$12,000.00
Milk Replacer		CWT	$162.00	$27.00	$4,374.00	$2,187.00	$4,374.00
Calf Grower		CWT	$26.00	$235.00	$6,110.00	$3,055.00	$6,110.00
Breeding		HEAD	$25.00	$100.00	$2,500.00	$2,500.00	$2,500.00
Vet and Medicine		HEAD	$50.00	$100.00	$5,000.00	$5,000.00	$5,000.00
Supplies		HEAD	$110.00	$100.00	$11,000.00	$11,000.00	$11,000.00
DHIA		HEAD	$25.00	$100.00	$2,500.00	$2,500.00	$2,500.00
Hauling Milk		CWT	$0.30	$16,000.00	$4,800.00	$12,800.00	$4,500.00
Assessment/Adver/etc.		CWT	$0.26	$16,000.00	$4,200.00	$4,200.00	$3,937.50
Haul and Market Culls			$0.00	$0.00	$843.20	$699.20	$818.70
Bldg. and Fence Repair		HEAD	$64.00	$100.00	$6,400.00	$6,400.00	$6,400.00
Machinery (Non-Crop)		HEAD	$48.00	$100.00	$4,800.00	$4,800.00	$4,800.00
Utilities		HEAD	$50.00	$100.00	$5,000.00	$5,000.00	$5,000.00
Labor (FICA)	$0.08	MEN	$20,000.00	$1.00	$21,530.00	$21,530.00	$21,530.00
Farm Insurance		HEAD	$21.00	$100.00	$2,100.00	$2,100.00	$2,100.00
Customer Hire		HEAD	$16.00	$100.00	$1,600.00	$1,600.00	$1,600.00
Farm Rent		HEAD	$15.00	$100.00	$1,500.00	$1,500.00	$1,500.00
Taxes		HEAD	$40.00	$100.00	$4,000.00	$4,000.00	$4,000.00
		TOTAL CASH EXPENSES			$331,436.73	$212,461.17	$330,849.73
Annual Debt Payments					$36,000.00	$36,000.00	$36,000.00
Return to Equity, Management and Operating Labor					$64,123.28[1]	$31,898.83[1]	$38,985.28[1]

Market Aspects

The organic market relies on the public's perception that conventional products including milk are less desirable for their health. Organic products have also been marketed the products as more economically friendly and healthier (3). The claim that organic milk is healthier has little to no credibility. The organic market has doubled since 2000 and has expanded from small specialty all natural stores to large big box stores such as Wal-Mart, Costco, and Safeway (see Figure 2). There is such high demand for organics that there are periodic shortages of supply. When demand is larger then supply there are ample opportunities for successful farming operation, and farmers are well aware of this.

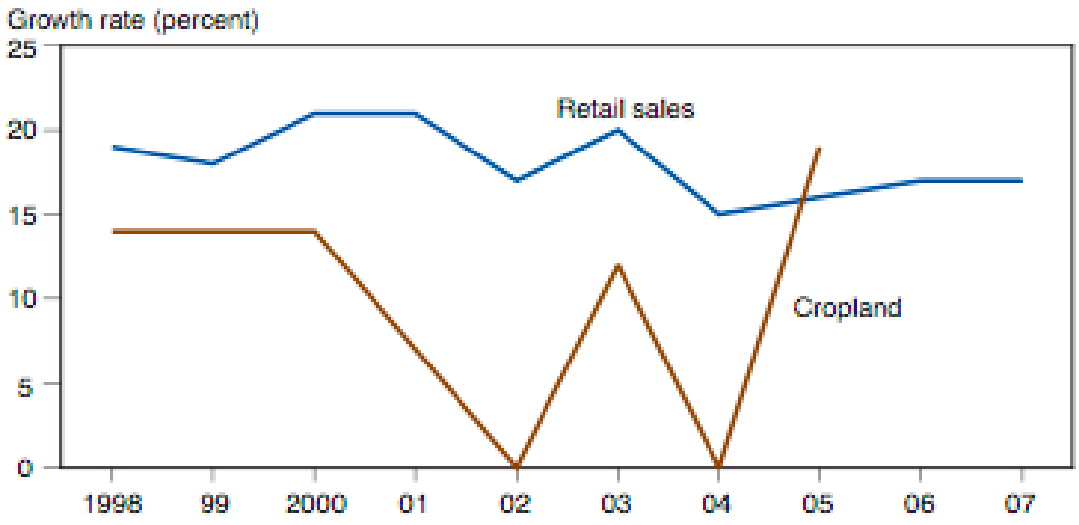

Figure 2. Growth rate of farms to meet demand (2).

Organic foods may either display the word “organic” on the product or can apply the USDA organic logo (4) (see Figure 3.). The logo is being used much more heavily due to consumer awareness. The logo is being seen in supermarkets but, more frequently, it is being used in the larger box stores to attract the consumer. Forty percent of U.S. consumers noticed the logo in 2005, up from only 19 percent in 2003. Retailing of organic products plays a large role in the increasing sales. The products listed as ‘100 percent organic’ must contain only organically produced ingredients. Products listed as ‘Organic’ must include no less than 95% of organically produced ingredients (4). These products do not include water or salt in the organic ingredients. Anything less then 95% may not include the USDA organic seal on it.

Other products that may have an organic label on them will be labeled ‘made with organic ingredients’. These products must contain at least 70% organic ingredients, but are not granted the right to use the USDA organic seal. They must list the organic products for the additional organic promotion. Penalties can exceed $11,000 for knowingly misadvertising products.

Figure 3. USDA Organic seal (4)

Organic consumption is generally greater in more urban areas. This is potentially due to the concentrated amount of people. In compact metro areas, people are generally more health conscious and typically pay more attention to aesthetics. Healthy living is the selling point for organic products. Families attempting to keep their children wholesome feel the added organic costs are well worth the benefits, whether or not there are health benefits. Due to the organic marketing scheme for being a healthier product to consumers, organic sales grow exponentially in these urban areas. Milk is nature's most wholesome product. It aids in weight loss, increases muscle growth, facilitates bone development and helps control blood pressure (14). These traits are highly sought after by today's consumers. The benefits of milk are known, however the uses of yield increasing substances are

frowned upon.

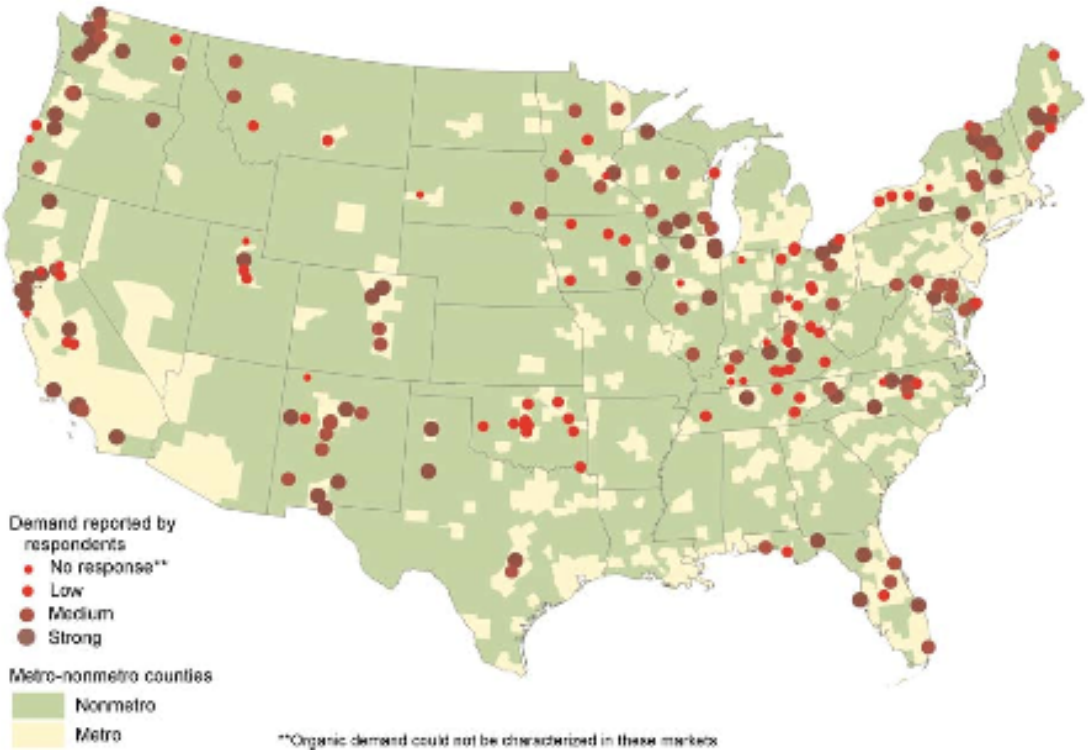

Figure 4. Areas in high demand for organic products (1).

Characteristics of consumers of organic milk can be found relative to demographics such as region, household income, age of consumers, education, presence of children and household size (see Figure 4.) The price of organic milk is substantially more than the conventional products (see Table 2.). For a low income family, it is increasingly difficult to budget organic over conventional milk. For a family who may consume high amounts of milk, choosing organic products becomes very costly. The idea that organic milk is healthier than conventional is more of a speculation

than a fact and can be weighed differently among consumers. Conventional marketing strategies must expand to different areas. The only way for conventional dairy producers to compete is by selling more products, and this occurs in the stores. Consumers need to be educated about what they are putting in their bodies. This is where organic marketing has excelled. The industry has managed to create some consumer doubt regarding conventional milk. The niche that organic products have gained can only be retrieved through reinforcement about how healthy conventional milk is.

The organic market is steadily increasing. The current recession has only slowed the progress of the organic dairy industry. It is an excellent opportunity for dairymen to achieve the added premiums organic milk can offer.